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ESTIMATING THE LIFETIME RISK OF TOTAL HIP AND KNEE REPLACEMENT IN THE UNITED KINGDOM

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Purpose: Establishing a population-based estimate for the lifetime risk of total hip and knee replacement (THR/TKR) is an important epidemiological development which will assist health service planners in assessing the future burden of lower limb arthroplasty.

Methods: We used data from the U.K. General Practice Research Database (GPRD) which contains all the computerised records of 6.25m patients, and is representative of the population of the U.K. We collected data on all THRs and TKRs performed between 1991 and 2006, a total of over 27,000 THRs and 24,000 TKRs. We calculated incidence rates for THR/TKR under a Poisson model and combined these rates with mortality rates from the U.K. Office for National Statistics (ONS) using a life-table framework. These estimates were then aggregated to produce a simple lifetime risk of THR and TKR by gender for age 50 and above. We also calculated the temporal trend in lifetime risk at age 50 by single calendar year from 1991 to 2006.

Results: We estimated that at age 50 the mortality-adjusted lifetime risk of THR was 7.80% for females and 5.05% for males (TKR: 6.66% and 5.04% respectively). The risks of THR for females aged 50 was 54% greater for than for males (32% greater for TKR). The risk percentage decreases with increasing age for both THR and TKR in males and females. At age 80 the gender gap in risk of THR remains in favour of females (53% higher) but in TKR it is two-thirds of that at age 50 (females 21% higher). Between 1991 and 2006, the lifetime risk of THR rose from 3.89% to 10.41% for females and for males from 3.43% to 6.34%. Over the same period, for TKR the risk for females increased from 2.78% to 10.02% and for males from 1.57% to 7.39%.

Current age (years)	Risk of primary THR		Risk of primary TKR	
	Female	Male	Female	Male
50	7.80%	5.05%	6.66%	5.04%
60	7.31%	4.71%	6.34%	4.91%
70	5.61%	3.50%	4.88%	3.81%
80	2.84%	1.86%	2.07%	1.71%

Conclusions: Using a simple method of aggregating mortality-adjusted, population-based incidence rates within a life-table, we have provided estimated lifetime risks of undergoing a THR/TKR in the U.K. from middle-age onwards. The lifetime risk at age 50 is only slightly more than at age 60, but this drops considerably at ages 70 and 80. The size of our estimates for lifetime THR and TKR risk at age 50 (between 5 and 8%) contrasts strongly with the relatively high level of lifetime risk at age 18 for osteoarthritis (OA) of the knee (40–50%) and the hip (25%) as seen in the United States. This difference between the lifetime risks of an established intervention (THR/TKR) and one of its main indications (OA) warrants further investigation.

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IDENTIFYING PREDICTORS OF PATIENT REPORTED OUTCOMES OF PRIMARY HIP REPLACEMENT SURGERY: A MULTI-CENTRE POPULATION BASED COHORT STUDY

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Purpose: While Total Hip Replacement (THR) is regarded as an effective procedure to reduce pain and disability, it is now recognized that a minority of patients do not improve. The aim of this study was to identify patient characteristics and intra-operative surgical variables associated with good patient reported outcomes after THR.

Methods: The Exeter Primary Outcomes Study (EPOS) is a prospective multi-centre study of 1375 patients (1431 hips) receiving primary THR for osteoarthritis. A cemented Exeter femoral component (Stryker Howmedica Osteonics, Mahwah, New Jersey) was used in all cases with

a number of different acetabular components. Patient demographics included age, gender, body mass index (BMI), occupation, analgesic use, co-morbidities, fixed flexion, SF36 mental health score. Intra-operative variables were operator grade, surgical approach, patient position, lavage system, cement pressurisation, type of cement, polythene and femoral head, femoral head size, femoral component size, duration of operation. Outcomes are defined as: a) post-operative Oxford Hip Scores (OHS); b) Patient Acceptable Symptom State (PASS) anchoring post-operative OHS on satisfaction with surgery. Repeated measures regression modelling is used to identify patient and surgical predictors of outcome. Multiple imputation methods were used to handle missing data, and bootstrap backward variable deletion to select variables included in final models.

Results: The majority of patients initially demonstrated substantial improvement in symptoms as measured by OHS with little further improvement after one year (Figure 1). The strongest determinant of outcome was the baseline OHS ($p < 0.001$), where patients with worse pre-operative pain/function had worse post-operative pain/function. Older age ($p = 0.053$), increasing BMI ($p = 0.003$), more co-morbidities ($p < 0.001$), and worse mental health ($p < 0.001$), were associated with worse outcomes. Patients with larger femoral component size (offset of 44 or more) had better outcomes ($p = 0.003$). Assessing the discriminatory ability of the model: (a) baseline OHS explained 10.3% of the variability in outcome, (b) baseline OHS + patient variables 14.7%, (c) baseline OHS + surgical 10.7%, (d) baseline OHS + patient + surgical 15.2%. Using the PASS score, predictors of a successful outcome were the same except the PASS score continued to improve over time.

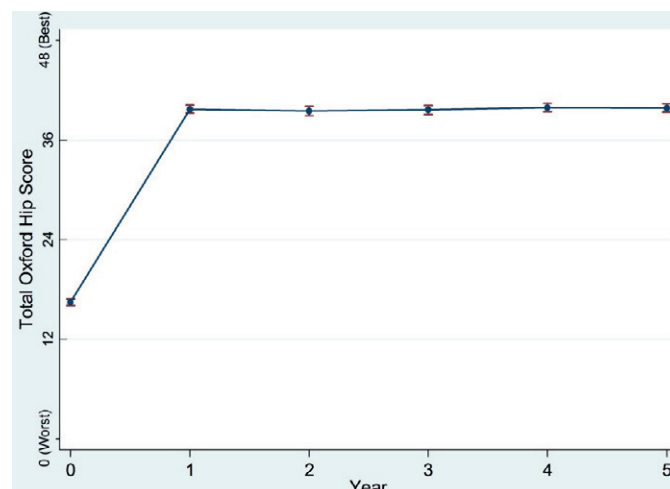


Fig. 1.

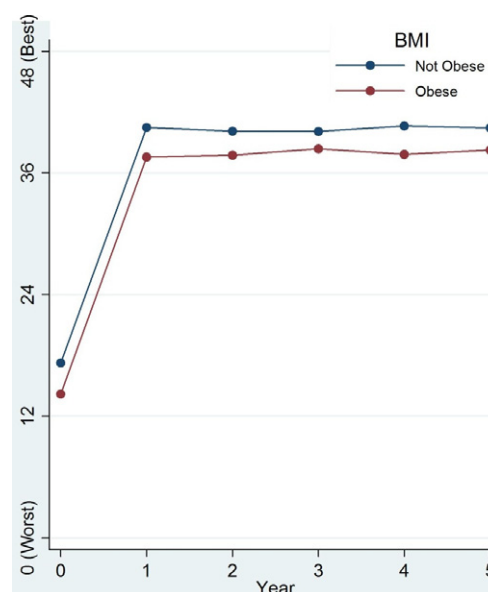


Figure 2.